

STATEMENT OF THE
AMERICAN DENTAL ASSOCIATION

TO THE

WELLNESS AND HUMAN RIGHTS SUBCOMMITTEE
GOVERNMENT REFORM COMMITTEE

UNITED STATES HOUSE OF REPRESENTATIVES

ON

THE ENVIRONMENTAL IMPACT OF MERCURY-CONTAINING
DENTAL AMALGAM

SUBMITTED BY

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Thank you, Mr. Chairman and members of the Subcommittee on Human Rights & Wellness for the opportunity to testify today on behalf of the American Dental Association (ADA) concerning “The Environmental Impact of Mercury-Containing Dental Amalgam.” The ADA represents over 70 percent of the dentists in the United States. My name is Dr. Frederick C. Eichmiller. I am the director of the ADA Foundation’s Paffenbarger Research Center in Gaithersburg, Maryland. With me is Mr. Jerome Bowman, an attorney in the ADA’s legal division. Mr. Bowman has been involved in the efforts of the ADA to forge a partnership with the Environmental Protection Agency (EPA) to further minimize the impact on the environment of waste dental amalgam.

I speak today on behalf of ADA members, 147,000 individual dentists and their families who live in the same communities and consume the same water as everyone else. We’re committed—both as health professionals and as individuals who depend on a clean, safe environment—to responsible stewardship of our natural resources. Protecting the public’s health through appropriate handling and disposal of dental waste is a natural extension of our top priority—to provide the best possible oral health care to patients.

Evaluation of Mercury in Dental Facility Wastewater

I have been asked to talk today primarily about the scientific assessment that the ADA commissioned from ENVIRON International Corporation concerning the release of mercury from dental facilities. The author of that assessment, Mr. Jay Vandeven, is in the audience should the panel have questions that I cannot answer.

The ENVIRON report, “Assessment of Mercury in the Form of Amalgam in Dental Wastewater in the United States,” (August 12, 2003) uses a “materials balance approach” to calculate the average discharge of mercury from a dental office and its aggregate impact on wastewater treatment plants.

The materials balance approach uses survey data on the number and frequency of amalgam restorations and a critical review of the scientific literature on the discharge of amalgam from dental offices. The results are compared to the known aggregate sale of amalgam and the cumulative data on mercury concentration in effluent leaving wastewater treatment plants and in sewerage sludge, as well as other measured ambient concentrations of mercury. The materials balance approach acknowledges that the amount of dental amalgam discharged cannot be more than dental amalgam used and avoids the variability inherent in sampling an episodic discharge using only a handful of measurements to represent the over 100,000 dental offices nationwide.

Dentistry, as a science-based profession, bases its positions on matters of public policy on the best available scientific evidence. This is why the ADA based its comprehensive plan to address amalgam discharges from dental offices on a scientific assessment of environmental impact. A key consideration for dentists, as small business people and health care providers, must be to use limited financial resources in a way that will best

promote patient care, enhance the safety of the dental office **and** protect the environment. We considered it important, therefore, to include a cost-benefit analysis in the ENVIRON study.

To summarize, briefly, the key findings of the ENVIRON study are:

- The ENVIRON study calculated that: (1) about 35 tons of mercury is used each year by dentists; (2) about 29.7 tons goes down the drain in the office sinks; (3) about 23.2 tons are captured by chair side traps and vacuum filter systems; (4) about 6.5 tons of total mercury enters POTWs from dental offices; but (5) only 0.3 tons is discharged to the surface water bodies and another 0.1 tons enters surface water from air emissions of sludge incinerators. Because of the decrease in industrial use of mercury, approximately 35% to 45% of the mercury entering POTWs is from dental office sources, but these sources do not significantly contribute to the mercury levels in surface water because, according to EPA, the "principal sources of fish contamination" with mercury "are air emissions of mercury from coal burning power plants, municipal waste incinerators and other industrial sources." US EPA, Star Report, Vol. 4, Issue 1, Mercury Transport and Fate in Watersheds at 2 (October 2000).
- The primary source of total mercury in surface water and fish is air deposition, not water discharges. (See Table 1, attached) Consequently, even if all dental amalgam were completely eliminated from wastewater, it would not significantly reduce the levels of mercury in fish and surface water. (See Table 2, attached)
- The chair-side trap and vacuum pump filter commonly used in dental offices is effective in capturing approximately 77 percent of the amalgam discharged in wastewater by dental offices.
- Because the mercury in dental amalgam is tightly bound and is released primarily as particulates, most of the amalgam (95%) that is not already captured by dental office traps and vacuums is captured in the sewage treatment plants.
- Amalgam separators, when used in conjunction with BMPs, will capture up to 95% of the remaining 23% not captured by the traps and filters. This results in a 33% to 43% reduction in mercury influent to POTWs due to the use of amalgam separators. But, because of the efficiencies of the POTW systems (capturing 95% of the amalgam entering the system), the incremental amount of amalgam captured by an amalgam separator will have little impact on the level of methylmercury in surface water or, more importantly, in fish. The Scientific Assessment compared the effectiveness of amalgam separators in achieving EPA's regulatory goal (reducing the methylmercury levels in fish to 0.3 ppm or lower) utilizing the analytical tools that EPA consistently uses when it decides whether potential pollution control measure is warranted or

whether one method is preferable to another (i.e., cost-effectiveness). This comparison indicates that using amalgam separators is much more costly per ton of mercury than the level EPA has determined does not warrant further controls for major industries. In fact, the cost per ton is higher than EPA guidance recommends for releases of mercury to the Great Lakes. The ADA believes that many local factors need to be considered in deciding which mercury sources should be addressed, the timing of such efforts, and the most appropriate mercury reduction measure appropriate for each type of source. Thus, no one rule can be applied to all dental offices. (See Table 3, attached)

ENVIRON subjected the study to pre-publication review from the Association of Metropolitan Sewerage Agencies (AMSA) and the EPA. Based on their input, ENVIRON made some modifications, but none affect the essential conclusion that discharges of dental amalgam in dental office wastewater do not contribute significantly to mercury in the environment. The ENVIRON study was submitted to both internal peer review (i.e. within the ADA and state dental associations) and external peer review by sewage treatment authorities and EPA reviews. The study will be submitted for publication soon and is expected to be published next year.

The ENVIRON report demonstrates that much can be achieved through the conscientious use of best management practices to capture and recycle amalgam waste. As a matter of public policy, the only reasonable approach is a case-by-case evaluation to determine whether additional amalgam capture technology, such as installation of amalgam separators, is necessary. We believe that where the local environmental conditions (i.e. mercury levels in surface waters, sludge, sediment or fish) do not exceed regulatory limits, stringent controls on mercury releases from dental offices should not be required. Where the concentrations of mercury in surface water, municipal sludge, sediment or fish tissue do exceed regulatory limits, dental offices are willing to do their fair share and to voluntarily go beyond BMPs to help in reducing the release of mercury in the form of dental amalgam.

Best Management Practices

For more than 25 years, the ADA has encouraged proper handling of amalgam to prevent its release into the environment. Last year, based on the findings of the ENVIRON study, the ADA strengthened its recommendations and increased its educational efforts aimed at dentists. The ADA “Best Management Practices for Amalgam Waste” (ADA BMPs) published in February 2003 provide comprehensive, easy-to-follow recommendations for managing amalgam waste and finding a recycler. They continue the ADA’s strong recommendation that dentists use only precapsulated amalgam alloy to avoid the release of free mercury.

Our goal is 100 percent recycling of amalgam waste captured by dental offices.

The ADA’s 2003 BMPs for Amalgam Waste makes it clear that although mercury in the form of dental amalgam is very stable, amalgam should not be disposed of in the garbage, infectious waste “red bag”, or sharps container. Dental amalgam waste should also not be

rinsed down the drain. The goal is to keep amalgam waste separate so it can be safely recycled. The Association is making a sustained effort to disseminate the BMP criteria to all of our members and has promoted the new BMPs in ADA publications and our web page.

In fact, the ADA will host a booth at the ADA Annual Session later this month with the theme -- “Protecting the Environment: What the Dental Office Can Do.” The booth will offer useful information on practices, products and services to help manage dental office wastes. Visitors can learn the latest information on the ADA’s best management practices for amalgam waste, managing silver and lead waste and recycling information as well as see a variety of amalgam separators, get information on the different types of available separator technologies and learn what to consider when purchasing a separator.

In addition, the ADA will host an open session course on dental office wastewater management at the Annual Session to discuss “Dental Office Water Quality and Wastewater Management.” This program will include:

- an overview of the sources of mercury to the environment,
- a review of regulatory requirements and trends for mercury control,
- a discussion of ADA-approved best management practices for mercury waste streams, and
- a review of available amalgam separator technologies, installation, operational requirements and recycling options.

As noted above, dentists share the concerns of the vast majority of Americans that we should all take reasonable steps to ensure that our environment is protected. The ADA will continue to actively educate our members on the benefits of universal adherence to BMPs.

Dental Amalgam Separators

The ADA does not oppose the use of dental amalgam separators by dentists. In fact, the ADA is the primary source of information to help dentists who wish to install a separator find the right equipment. We recognize that there may well be specific environmental conditions or local laws that would make the use of separators appropriate. For example, where local environmental conditions demonstrate that environmental standards are exceeded and airborne sources of mercury are not predominant, separators may make sense.

However, local environmental conditions vary widely. A requirement to install separators in dental offices throughout the country is not justified. One size does not fit all. One problem with universal separator requirements is that such requirements do little to protect the environment. Separators and Publicly Owned Treatment Works (POTWs) remove very nearly the same size amalgam particles. In other words, separators offer little additional protection to the environment. Thus, where significant surface water contamination is due to air deposition, separators simply will not make much difference,

or do much to solve the problem of surface water contamination. Where air deposition is not a significant source of mercury to the surface waters or where POTW sludge levels exceed or even approach regulatory limits, separators may serve a valid environmental purpose.

For dentists who want or need to install separators, as described above, we are providing our members the opportunity to learn more about separators at the Association's Annual Session in a couple of weeks. In addition, two articles about separators have been published in the monthly *Journal of the American Dental Association* (JADA), which is sent to all ADA members. In May 2002, the article titled "Laboratory Evaluation of Amalgam Separators" compared 12 separators that were on the market, showing that all 12 exceeded the International Organization for Standardization requirement of 95 percent amalgam removal efficiency. An article published in the August 2003 edition of *JADA*, titled "Purchasing, Installing and Operating Dental Amalgam Separators", provided dentists information on what to consider in choosing an amalgam separator as well as a more complete description of the short- and long-term costs of the available options.

Ultimately, we believe the most effective and responsible action we can take is to encourage state and local dental societies to work directly with the regulatory agencies that have responsibility for establishing local and state environmental policy. In this way, they can work together to find the most effective solution for their particular jurisdiction. If that solution includes the use of separators, we'll do our best to help our members comply.

National Advocacy Initiative

On April 18 of this year, the Association approached the Environmental Protection Agency (EPA) and proposed a "National Advocacy Initiative" with the goal of reducing amalgam waste releases into the environment. The action plan provides for the initiation of a dialogue with regulatory authorities so that a consensus on the appropriate approach of reducing dental amalgam discharges can be reached. The plan seeks to establish a national "guidance" for state and local regulators and dental societies, but expressly recognizes that more stringent requirements would apply where environmental conditions and regulatory requirements require more reductions.

Our plan includes the following:

Recycling and the establishment of local bulk mercury collection programs: We are proposing that EPA convene a working group consisting of the agency, ADA, interested state dental societies, state regulators, amalgam manufacturers and recyclers, and dental waste disposal companies to identify and eliminate barriers to recycling. In addition, the ADA supports local bulk collection programs, such as the Michigan program. The Association would be willing to discuss what, if any, role it can take to encourage such

activities. One of the possibilities is for the ADA and EPA to develop a model state or local recycling program.

Best Management Practices: The ADA will work with the EPA to implement the most effective ways to educate our members concerning the benefits of BMPs and encourage universal compliance.

ADA Education Program: The ADA would work with the EPA to develop a web page designed to educate dentists about environmental laws and to facilitate compliance.

In addition to the web page, the ADA will educate dentists on reducing releases of amalgam from dental offices, legal requirements applicable to dentists, and other related matters via other means – these could include seminars, CDs, videos, printed brochures, articles in ADA publications and meetings with dental societies. In addition, we will work with the American Dental Education Association to develop model environmental protection curricula for dental schools.

National Dental Amalgam Minimization Plan: We are proposing that EPA work with the ADA to develop guidance that would recommend approaches for the states to take to encourage the reduction of amalgam discharges from dental offices to sewer systems. Once a final plan is issued, EPA will send it to the states and EPA regions. The ADA recognizes that under the provisions of the Clean Water Act states are allowed to be more stringent.

Inventory of Dental Amalgam and Releases: The ADA would compile information to prepare and maintain an inventory of dental amalgam use. The purpose is to track progress in reducing wastewater discharges of amalgam from dental offices. ADA would conduct member surveys to obtain information. EPA may also request information from amalgam manufacturers and recyclers.

Research: We suggest several areas where the EPA may want to provide support for further research.

- Develop joint ADA-EPA pilot projects for specific geographic locations (e.g. by state) to test the effectiveness of amalgam collection devices in capturing amalgam in dental offices prior to discharge.
- Research on more cost effective separator technology via a small business innovative technology research grant.
- Study the degree and mechanism by which amalgamated mercury may be methylated in a wastewater treatment plant and in the environment to become bioavailable.

Incentives to Participate in Voluntary Amalgam Reduction Programs: Working with EPA and state and local authorities, the ADA supports the establishment of incentives (e.g. grants to install mercury collection technology) for dentists to take voluntary amalgam reduction measures. The program would also provide individual dentists and state and local dental societies some concrete recognition of their efforts.

We are pleased to be able to report to the Subcommittee that the Association representatives have already begun a series of meetings with EPA officials to continue discussions about working together to implement elements of this initiative.

In closing, Mr. Chairman, thank you for this opportunity today to explain the actions the ADA is taking regarding amalgam waste discharges. I would be pleased to answer any questions at this time. Mr. Chairman, the ADA would also like to reserve the right to submit additional information for the record that we believe would be helpful to your inquiry.